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ABSTRACT

A packet of ten evaluation instruments was developed that emphasizes decision-oriented evaluation of inservice teacher preparation programs in secondary school science. It is hoped that these instruments are generalizable enough to be shared, modified, used, and/or validated by participants in workshops similar to the one in which these instruments were developed. The inservice program for which the packet was developed is closely akin to programs typically funded by federal, state, and private agencies. Many times these agencies receive highly desirable training proposals that lack a solid evaluation plan: this packet is offered as a basis for an evaluation plan. The ten instruments measure skills necessary for systematic observations and utilization of data collection procedures and skills in process relationships. Each of the ten instruments is presented along with a brief description of the rationale for its inclusion in the packet. The instruments are: (1) Perceptions of Self as a Teacher; (2) Workshop Guest Speaker Evaluation; (3) Affective-Oriented Perceptions of Workshop Activities; (4) Affective Dimensions of Group Functioning; (5) Evaluation of Workshop Objectives; (6) Open-Ended Evaluation of Workshop Activities; (7) Science Classroom Profile; (8) Classroom Observational Schedule; (9) Student Questionnaire; and (10) Preservice Teacher's Perceptions of Inservice Teacher's Supervisory Behavior. (MM)

INSTRUMENT 3

AFFECTIVE-ORIENTED PERCEPTIONS OF WORKSHOP ACTIVITIES

...tion of Teacher Education

FORUM Teacher Education FORUM

2

TEACHER EDUCATION FORUM

The *Forum Series* is basically a collection of papers dealing with all phases of teacher education including inservice training and graduate study. It is intended to be a catalyst for idea exchange and interaction among those interested in all areas of teacher education. The reading audience includes teachers, school administrators, governmental and community administrators of educational agencies, graduate students and professors. The *Forum Series* represents a wide variety of content: position papers, research or evaluation reports, compendia, state-of-the-art analyses, reactions/critiques of published materials, case studies, bibliographies, conference or convention presentations, guidelines, innovative course/program descriptions, and scenarios are welcome. Manuscripts usually average ten to thirty double-spaced typewritten pages; two copies are required. Bibliographical procedures may follow any accepted style; however, all footnotes should be prepared in a consistent fashion. Manuscripts should be submitted to William E. Blanton, editor. Editorial decisions are made as soon as possible: accepted papers usually appear in print within two to four months.

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INSTRUMENTATION FOCUSING ON FORMATIVE EVALUATION ASPECTS OF AN INSERVICE TEACHER PREPARATION MODEL

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INTRODUCTION

Recently, much concern has been expressed about the importance of inservice preparation in science education along with the accountability for such activities. An attempt has been made to develop and try out a set of generalizable instruments which emphasize decision-oriented evaluation of an inservice teacher preparation program in secondary school science. The context for this endeavor was embedded in a University/School cooperative teacher preparation model funded at the pre-service level by Indiana University-Bloomington and at the inservice level by the National Science Foundation. The partners in this venture were the faculty of Indiana University's Science Education Department and the secondary school teachers of Monroe County, Indiana 47401.

It is hoped that this packet of instruments could be generalized and/or validated by others in similar summer workshop training/preparation situations. The inservice project packet has been designed, is rather closely tailored to those of the National Science Foundation (Implementation Programs, E.S.E.A. Programs, Urban Rural Programs, Bilingual Training Programs, Desegregation Centers, etc. Many times these federal agencies receive highly desirable training proposals which lack a solid evaluation plan; this paper/packet could be the basis for such a plan.

RATIONALE

When change in public schools and universities requires the implementation of new processes and practices, there is the need to first conduct descriptive evaluations designed to assess professional competence, values and attitudes, project strengths and weaknesses, and the goals of all groups involved. This University/School cooperative project assessment mostly took on the form of "decision-oriented" or formative evaluation (Stufflebeam, 1971). This type of evaluation used information collected from all levels for decision making and desirable project improvement.

The framework for assessing the degree to which the project hoped to succeed focused on the need for a variety of evaluation techniques. In order to succeed, the evaluation plan had to contain mechanisms for change and improvement based on a continuous flow of feedback data regarding the effectiveness of the University/School cooperative project in achieving its specified objectives. It was suggested, therefore, that the original evaluation plan (*FIGURE A*) be composed of both formative and summative elements. The formative phase, which included needs-assessment, diagnosis, and planning, was essentially concerned with assessing the degree to which each project component was operational and achieving its desired objectives. This phase of the evaluation assessed the degree to which the treatment aspects of the University/School cooperative model were functioning as defined in the original proposal or by the Project Director. A summative stage involved the overall evaluation of project success. This means of evaluation usually occurred at or near the termination of project key activities. Summative evaluation included measures of consultant ratings and student observations and attitudes, as well as indices

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Decisions	Objectives	Implementation	Evaluation of Outcomes
1. Are the objectives of the program worthwhile and appropriate?	a. To provide a program whose objectives are relevant to the needs of the participants (inservice teachers)	a. Provide instruction and activities in the program to accomplish program objectives b. Allow small groups of inservice teachers to establish their own problem-solving objectives	a. Likert scale instrument to assess program objectives
2. Can we improve the professional instructional capabilities of inservice science teachers?	a. Enable inservice teachers to identify their problems and needs	a. Small working groups of teachers will be established on the basis of common interests in curricula or pedagogy. Contracts will be prepared by the groups and solutions sought with the aid of: i. science education doctoral students, and ii. research scientists	a. Product evaluation of materials and skills (contracts)
	b. Assist inservice teachers in the development of new teaching skills and materials	b. Teachers will study through involvement national science curricula and individualization of instruction	b. Self-assessment scale administered to teachers
	c. Assist inservice teachers in developing skills for the implementation of nationally supported science curricula and the individualization of instruction	c. The "Science Today" lectures shall focus on current research	Questionnaire for evaluation of guest lectures

FIGURE A

DECISION MAKING MATRIX FOR PROGRAM DEVELOPMENT AND MODIFICATION

Decisions	Objectives	Implementation	Evaluation of Outcomes
3. Can we prepare in-service teachers to be good data collectors and pre-service teacher supervisors?	a. Develop skills in the collection and recording of data from the systematic observation of classroom lessons	a. Individualized instructional modules on the systematic observation of teaching skills	a. Practice exercises and self-tests in the systematic observation modules
	b. Develop skills in indirect conferencing techniques	b. Practice in the use of indirect counseling techniques with pre-service teachers	b. Observations and/or reports of pre-service teacher conferences
4. How can we facilitate the cooperation between school and university personnel?	a. Generate a feeling of "comraderie" among the inservice teachers	a. Provide opportunities for teachers to work together in a harmonious, supportive atmosphere	a. Self-assessment of group dynamics
	b. Improve the personal and working relationships between the I.U. staff and the inservice teachers from Monroe County	b. I.U. staff and the teachers will work together towards common goals established through teacher-made contracts	b. Series of semantic differentials to evaluate program staff and implementation efforts
		c. Encourage the formation of a cooperative teacher organization	
		d. Scheduled social gatherings	

FIGURE A (Cont'd)

DECISION MAKING MATRIX FOR PROGRAM DEVELOPMENT AND MODIFICATION

revealing the degree of successful implementation of project treatment components. If the evaluation plan were to be effective, it had to utilize a multifaceted approach. The evaluation effort, therefore, was designed to describe both the intent of the project and its methodology, to estimate its degree of implementation, and to assess the degree to which it had succeeded in achieving its performance goals. The evaluation plan provided much more than terminal evaluation. At a time when program alterations could still be made, it provided data regarding: (1) whether or not the project was succeeding; and, (2) if the project was not succeeding, why this was so.

PROCEDURES

The inservice education strategy was that of a conventional six-week summer (1974) workshop and an academic year (1974-75) follow-up by way of two weekend mini workshops per semester, one demonstration day per semester, and bi-weekly consultant visits throughout the school year. Initially, a formative evaluation design (FIGURE A) was developed; this decision-making matrix was a modification of the much-heralded CIPP Model of Stufflebeam (Stufflebeam, 1967). Based on the needs of both the science education faculty and the inservice teachers, selected areas of concern were identified with appropriate instrumentation designed to meet these needs. Keeping the concern of decision making in mind with respect to on-going project modification and improvement, the instruments took the forms of Likert scales, semantic differentials, SA-SD's, or open-ended response items.

Description of Subjects

The data necessary to try out the instrument packet were obtained from 30 in-service teachers from a mid-eastern town (pop. est. 31,000). Although often confusing and misleading, and often misinterpreted, it is always interesting to examine the demographic dimensions of people, places, and things associated with public school classrooms. The number of teachers per arbitrarily defined age groupings was 12 between twenty-one and thirty years, 11 between thirty-one and forty, 4 between forty-one and fifty, 3 between fifty-one and sixty, and none over sixty years of age. When considering the number of years of teaching experience, there were 12 inservice teachers with no experience to five years, 8 with six to ten years, 6 with eleven to fifteen years, 3 with sixteen to twenty years and 1 with over twenty years of teaching experience. Turning to the current teaching assignment of the involved inservice teachers, there were 12 teaching high school (9-12) science, 7 teaching middle school (6-8) science, 3 teaching high school (9-12) math, 2 teaching middle school (6-8) math, 2 teaching elementary school (K-6), and 2 labeling themselves as "other." In relation to the sex of the inservice teachers, there were 11 females and 19 males. When taking into account the type of school in which the participants taught, there were 29 from public schools and 1 from a non-public school. And lastly, in view of the subject area preparations and/or cognate fields of the inservice teachers, there were 12 whose major interest was biology, 3 were in physics, 2 were in chemistry, 4 were in earth science, 3 were in mathematics, 4 had a background in elementary education, and 2 identified themselves as "other."

Data Analyses

The information obtained was analyzed descriptively by way of means, standard deviations, modes, medians, and ranges along with frequencies and percentages. Aside from the quantitative descriptive differences as expressed by the instruments'

items or dependent variables, for further needed assurance, the data were also analyzed through the use of the nonparametric statistical treatment chi-square where a significant difference had to exhibit a probability that was less than .05 ($p < .05$). The differences determined by the use of chi-square were delineated by the demographic dimensions or independent variables discussed above. Quantitative findings in many instances were supplemented by inservice teacher open-end commentary as it pertained to a given instrument. The findings were used as the basis for rational project decision-making; the intent was not to conduct an elaborate inferential research study. Generally speaking, these conventional descriptive statistics helped yield desirable information; these ratings aided immensely with respect to decision-making and giving the project direction.

SUMMER WORKSHOP

The essence the workshop program focused on the development of specific skills needed for implementing modern secondary school science curricula. These are skills necessary for systematic observations and the utilization of data collection procedures needed for local program evaluation, and skills in process interaction necessary for the development of long-lasting and productive interpersonal relationships. The remainder of this section will focus on a brief discussion of the instruments developed and employed during the six-week summer workshop. The focus will not be on a discussion of inferences and conclusions associated with the collected data.

Self-Assessment as a Teacher

In order to obtain a baseline on how the inservice teachers perceived themselves as functioning in the classroom and in the secondary school as a whole, *INSTRUMENT 1* was constructed from several rating scales used by school administrators for performance evaluation and by universities for admissions into graduate study. The "Perceptions of Self as a Teacher" (*INSTRUMENT 1*) was administered as a pretest during June 1974 on the first day of the workshop, and was re-administered in a posttest situation during the last academic-year follow-up session in April 1975. Other possible uses for *INSTRUMENT 1*, upon modification, could be for screening and selecting participants. Ratings might be obtained from building principals, department chairpersons, or former professors of the inservice teachers.

Evaluation of Consultant Performance

Usually during an externally funded workshop, the services of consultants are procured to perform some type of instructional function. Many times the consultants are reimbursed by way of honoraria. From both participant response and expenditure accountability standpoints, it might be wise to evaluate consultant performance. During the workshop four consultants were brought in for half-day presentations and interactions. Two were science educators, one a geophysicist and the other a geneticist. The participants were asked to respond to *INSTRUMENT 2* on the day following the consultant visit. "Workshop Guest Speaker Evaluation" (*INSTRUMENT 2*) is a collection of modified items coming from a school of education and the university forms used for evaluating instruction.

INSTRUMENT 1

PERCEPTIONS OF SELF AS A TEACHER

Please rate yourself as a teacher on each of the items below. Circle the number of the rating which you feel is most appropriate. Please make comments on any item that you wish.

1. Your Enthusiasm for and Interest in Teaching as a Career:

1	2	3	4	5
poor	fair	average	excellent	truly exceptional

2. Your Potential All-Round Ability and Effectiveness as a Teacher:

1	2	3	4	5
poor	fair	average	excellent	truly exceptional

3. Your Capacity for Improving Your Teaching Ability:

1	2	3	4	5
poor	fair	average	excellent	truly exceptional

4. Your Interest in Improving Subject Matter Knowledge:

1	2	3	4	5
poor	fair	average	excellent	truly exceptional

5. Your Capacity to Develop Student/Pupil Interest and Understanding:

1	2	3	4	5
poor	fair	average	excellent	truly exceptional

6. Your Willingness to Cooperate with Colleagues, Administrators and Students:

1	2	3	4	5
poor	fair	average	excellent	truly exceptional

7. Your Receptiveness to Constructive Suggestions from Others:

1	2	3	4	5
decidedly deficient	distinctly below average	average	distinctly above average	exceptional

8. Extent to Which You Can Be Relied Upon:

1	2	3	4	5
completely untrustworthy	questionable at times	dependable	superior dependability	completely trustworthy

9. Extent to Which You Have Been Conscientious in the Performance of Your Tasks:

1	2	3	4	5
usually negligent	indifferent	average	generally diligent and faithful	supremely

10. Your Capacity to Work on Tasks with Other People:

1	2	3	4	5
much out of gear	sporadic	average	generally cooperative	supreme

11. Your Interest in Improving the Science Program of Your School:

1	2	3	4	5
poor	fair	average	excellent	truly exceptional

12. Your Interest in Improving the Entire Educational Program in the School:

1	2	3	4	5
poor	fair	average	excellent	truly exceptional

13. Your Intellectual Curiosity:

1	2	3	4	5
decidedly deficient	distinctly below average	average	distinctly above average	exceptional

14. Your Power of Grasping Ideas:

1	2	3	4	5
decidedly deficient	distinctly below average	average	distinctly above average	exceptional

INSTRUMENT 1 (Cont'd)

15. Your Ability to Work Independently as a Student:

1	2	3	4	5
wholly dependent	needs much guidance	average independence	needs little guidance	independent

16. Your Originality in Thinking:

1	2	3	4	5
decidedly deficient	distinctly below average	average	distinctly above average	exceptional

17. Your Personality and Initiative:

1	2	3	4	5
displeasing	colorless	average	pleasing	extremely appealing

18. General Rating of Yourself as a Teacher:

1	2	3	4	5
poor	fair	average	excellent	truly exceptional

COMMENTS

Key to Items Above

( ) _____

_____

( ) _____

_____

( ) _____

_____

( ) _____

_____

( ) _____

_____

( ) _____

_____

INSTRUMENT 2

WORKSHOP GUEST SPEAKER EVALUATION

Speaker: _____

We would like you to help us evaluate this guest speaker. The following statements relate to the quality of the speaker's presentation. Please indicate your agreement or disagreement with each statement by circling the appropriate letters: sa=strongly agree; a=agree; u=undecided; d=disagree; sd=strongly disagree.

1.	The speaker had a thorough knowledge of the topic.	sa	a	u	d	sd
2.	The speaker held my interest.	sa	a	u	d	sd
3.	The speaker's voice was pleasant.	sa	a	u	d	sd
4.	I would encourage my friends to hear this speaker.	sa	a	u	d	sd
5.	The speaker was enthusiastic about the topic of his presentation.	sa	a	u	d	sd
6.	The presentation was easy to understand.	sa	a	u	d	sd
7.	The presentation was well organized.	sa	a	u	d	sd
8.	The topic of the presentation was relevant to my interests.	sa	a	u	d	sd
9.	I would like to hear this speaker again.	sa	a	u	d	sd

Intrapersonal Dimensions

One of the main themes of the workshop was a focus on the affective domain. The inservice teachers interacted in non-threatening sessions and hopefully developed the interpersonal relationships necessary for continuous long term cooperation. The affective dimensions were treated directly in a few sessions. Developing the appropriate cooperative tone was so essential that attempts were made to insure that this goal received constant attention in planning, implementing, and evaluating the program. In lieu of asking the participants to write a paragraph on "how they felt" periodically, *INSTRUMENT 3* was developed with the aid of several textbook chapters on semantic differentials (Kerlinger, 1964; Oppenheim, 1966; and Tuckman, 1972). "Affective-Oriented Perceptions of Workshop Activities" (*INSTRUMENT 3*) was administered during the last day of the second week, fourth week, and sixth week. The responses were processed, computed, and tabulated along four generalized dimensions and with respect to the 40 specific dimensions.

Participant Group Functioning

During the six-week workshop experience, much of the participant work time was spent in small groups of three to four teachers. Since so much of the total workshop time was allocated to participant group work, it was felt that an evaluation of this type of activity was appropriate. *INSTRUMENT 4* was developed as a result of dimensions identified by science education faculty, graduate assistants, and the inservice teachers. "Affective Dimensions of Group Functioning" (*INSTRUMENT 4*) was administered during the last week of the workshop experience. Teachers' reactions to this type of functioning were very favorable.

Workshop Objectives' Evaluation

This component of the overall assessment plan began to look at the efficacy of the workshop from a summative evaluation perspective. The inservice teachers were asked to assess their achievement of a given workshop objective by rating it on a one (perceived negative) to five (perceived positive) continuum of a Likert-type scale (*INSTRUMENT 5*). Usually the first portion of an item triad surveyed the absence to the abundant presence of a given objective achievement; the second part of the triad usually focused on the quality of the activities engaged in (ill-chosen and ineffective to very effective activities) for achieving the objective; and the third segment of the triad usually dealt with the number of opportunities available to achieve the given objective (far too few opportunities to more than enough opportunities). Ample lined space was also provided for optional in-service teacher open-ended commentary following the item triad for each program objective. "Evaluation of Workshop Objectives" (*INSTRUMENT 5*) was administered to the participants on the last day of the workshop.

Open-Ended Workshop Evaluation:

It was the general consensus that the participants should be given the opportunity to express themselves with respect to making judgmental comments on any aspect of the workshop. Stake (1970) advocated that judgment data should be part of any evaluation scheme. The term judgment (Stake, 1970) has been used in a broad sense to include statements of priorities, values, opinions, and attitudes. Judgment data provided critically important information about workshop functioning because they represented what individuals perceived as happening. These perceptions may

INSTRUMENT 3

AFFECTIVE-ORIENTED PERCEPTIONS OF WORKSHOP ACTIVITIES

Date: _____

Please rate the individual or relationship whose name appears at the top of each series of items using the scales below the item stem (in capital letters). As an example, if you feel that the individual or relationship stated in the item stem is best characterized at either end of the continuum or somewhere between, circle the number which best describes what the individual or situation stated means to you.

THE GENERAL ATMOSPHERE OF YOUR WORKSHOP EXPERIENCE HAS BEEN:

1.	Happy	1	2	3	4	5	6	7	Unhappy
2.	Cold	1	2	3	4	5	6	7	Warm
3.	Simple	1	2	3	4	5	6	7	Complicated
4.	Relaxed	1	2	3	4	5	6	7	Tense
5.	Pessimistic	1	2	3	4	5	6	7	Optimistic
6.	Emotional	1	2	3	4	5	6	7	Unemotional
7.	Democratic	1	2	3	4	5	6	7	Authoritarian
8.	Satisfying	1	2	3	4	5	6	7	Dissatisfying
9.	Competitive	1	2	3	4	5	6	7	Cooperative
10.	Dynamic	1	2	3	4	5	6	7	Static

HOW WOULD YOU CHARACTERIZE YOURSELF DURING THE WORKSHOP EXPERIENCE:

11.	Leader	1	2	3	4	5	6	7	Follower
12.	Moody	1	2	3	4	5	6	7	Even disposition
13.	Dependent	1	2	3	4	5	6	7	Independent
14.	Active	1	2	3	4	5	6	7	Passive
15.	Outgoing	1	2	3	4	5	6	7	Shy
16.	Vivacious	1	2	3	4	5	6	7	Quiet
17.	Controlled	1	2	3	4	5	6	7	Erratic
18.	Serene	1	2	3	4	5	6	7	Stormy

26.	Trusting	1	2	3	4	5	6	7	Suspicious
27.	Democratic	1	2	3	4	5	6	7	Authoritarian
28.	Dangerous	1	2	3	4	5	6	7	Safe
29.	Happy	1	2	3	4	5	6	7	Unhappy
30.	Emotional	1	2	3	4	5	6	7	Unemotional

HOW WOULD YOU DESCRIBE THE GENERAL DISPOSITION OF T[illegible]ORKSHOP STAFF:

31.	Happy	1	2	3	4	5	6	7	Unhappy
32.	Cold	1	2	3	4	5	6	7	Warm
33.	Simple	1	2	3	4	5	6	7	Complex
34.	Relaxed	1	2	3	4	5	6	7	Tense
35.	Accepting	1	2	3	4	5	6	7	Rejecting
36.	Pessimistic	1	2	3	4	5	6	7	Optimistic
37.	Emotional	1	2	3	4	5	6	7	Unemotional
38.	Democratic	1	2	3	4	5	6	7	Authoritarian
39.	Satisfied	1	2	3	4	5	6	7	Dissatisfied
40.	Dynamic	1	2	3	4	5	6	7	Static

INSTRUMENT 4

AFFECTIVE DIMENSIONS OF GROUP FUNCTIONING

Read each statement carefully. Then indicate whether you (a) agree, (pa) probably agree, (pd) probably disagree, or (d) disagree with each statement. Circle the letters to indicate your answers.

1.	The teachers in my group(s) worked well together.	a	pa	pd	d
2.	This workshop experience enabled me to get to know my fellow teachers better.	a	pa	pd	d
3.	I got several good ideas from the other teachers in my group(s).	a	pa	pd	d
4.	Everyone in my group(s) made important contributions to the group(s') progress.	a	pa	pd	d
5.	I enjoyed working with teachers from neighboring schools.	a	pa	pd	d
6.	I think I would like to communicate more often with teachers from neighboring schools.	a	pa	pd	d
7.	I would be interested in attending regular (monthly, bi-monthly, semi-annually, etc.) meetings of local science and math teachers to discuss new classroom ideas.	a	pa	pd	d
8.	As a result of this workshop I feel that a closer bond has been established between the participating teachers.	a	pa	pd	d
9.	I would like to be involved in another workshop where I could work with teachers from neighboring schools.	a	pa	pd	d

INSTRUMENT 5

EVALUATION OF WORKSHOP OBJECTIVES

Based on your participation in this six-week summer program, to what degree do you feel you have achieved the following objectives:

(A) Circle the number which best shows your relative position or reaction on the continuous scale.

(B) Comment(s) sections are optional.

I. OBJECTIVE: Develop instruction and the activities that have been relevant to the participants' needs:

1. Very relevant	1	2	3	4	5	Irrelevant
2. Activities were ill-chosen and ineffective	1	2	3	4	5	Activities very effectively contributed

Comment(s): _____

_____

_____

II. OBJECTIVE: Develop new teaching skills and materials:

3. Developed a very large number	1	2	3	4	5	Developed none
4. They will be very useful	1	2	3	4	5	Probably useless
5. Activities were ill-chosen and ineffective	1	2	3	4	5	Activities very effectively contributed

Comment(s): _____

_____

_____

III. OBJECTIVE: Develop skills in the collection and recording of data from systematic observation of classroom lessons:

6. Developed a great deal of skill	1	2	3	4	5	Developed no skill

INSTRUMENT 5 (Cont'd)

7. Activities were ill-chosen and ineffective	1	2	3	4	5	Activities very effectively contributed
8. No opportunities were provided	1	2	3	4	5	More than enough opportunities were provided

Comment(s): _____

_____

_____

IV. OBJECTIVE: Develop skills in indirect conferencing techniques:

9. Developed a great deal of skill	1	2	3	4	5	Developed no skill
10. Activities were ill-chosen and ineffective	1	2	3	4	5	Activities very effectively contributed
11. No opportunities were provided	1	2	3	4	5	More than enough opportunities were provided

Comment(s): _____

_____

_____

V. OBJECTIVE: Develop a feeling of "fellowship" with the other inservice teachers:

12. Developed a very strong feeling	1	2	3	4	5	No such feeling was present
13. Activities facilitated this development	1	2	3	4	5	Activities hindered this development

Comment(s): _____

_____

_____

VI. OBJECTIVE: Develop better personal and working relationships with the science education staff:

14. Developed excellent relationships	1	2	3	4	5	Developed poor relationships

INSTRUMENT 5 (Cont'd)

15. Activities facilitated this development	1	2	3	4	5	Activities hindered this development

Comment(s): _____

_____

_____

VII. OBJECTIVE: Develop skills for the implementation of nationally supported science curricula:

16. Developed a very large number	1	2	3	4	5	Developed none
17. Activities were ill-chosen and ineffective	1	2	3	4	5	Activities very effectively contributed
18. No opportunities were provided	1	2	3	4	5	More than enough opportunities were provided

Comment(s): _____

_____

_____

VIII. OBJECTIVE: Develop skills necessary for the individualization of instruction:

19. Developed a very large number	1	2	3	4	5	Developed none
20. Activities were ill-chosen and ineffective	1	2	3	4	5	Activities very effectively contributed
21. No opportunities were provided	1	2	3	4	5	More than enough opportunities were provided

Comment(s): _____

_____

_____

not correspond to the intentions or perceptions of those who designed the workshop. However, what participants perceive as happening represents reality to them, and this might be far more important for the evaluation of a workshop than what is supposed to be happening. As a result of such thinking, *INSTRUMENT 6* was developed to capture the candid and sincere responses of the inservice teachers. "Open-Ended Evaluation of Workshop Activities" (*INSTRUMENT 6*) was administered to the participants during the last day of the workshop.

ACADEMIC YEAR FOLLOW-UP

The academic year follow-up program consisted of two mini workshops per semester. During the fall semester of 1974 they were held in October and December, and during the spring semester of 1975 the mini workshops were conducted during February and April. The real thrust of the academic year follow up, however, had been the bi-weekly consultant visits to the involved secondary schools by a science education department staff member to help the implementing teachers and interact with secondary school students. Once again, in this section, the discourse will focus on the instruments developed and used during the academic year. The emphasis will not be on a discussion of inferences and conclusions associated with the collected data.

Classroom Science Teaching

During the summer workshop, the inservice teachers received instruction and were provided practice in using systematic data collection techniques. The participants were fairly well schooled with respect to the need to collect observational data and became quite willing to allow data to be collected from their classrooms. During the first follow-up session in October the project staff and small groups of the teachers with the aid of a few unidentified dittoed evaluation scales developed *INSTRUMENT 7*. The instrument was administered four times during the academic year in the months of October 1974, December 1974, February 1975, and April 1975. "Science Classroom Profile" (*INSTRUMENT 7*) was filled out by the consultant immediately after observing a teacher's classroom and interacting with secondary school students. (There was only one science education staff person serving as the implementation consultant throughout the academic year.) The consultant agreed to use the same set of arbitrarily established criteria during each assessment process.

Classroom Observation

During the first follow-up session in October, it was agreed that a second set of classroom observational data be collected focusing more specifically on selected teacher behavior. Another set of information could also complement the first set. Reliability between both sets of data would also lend credence to the rating process of the visiting consultant from a qualitative/descriptive viewpoint. The project staff and a small group of teachers using several collected unidentified dittoed questionnaires developed *INSTRUMENT 8*. This instrument was responded to by the consultant immediately following an observation/conference with a teacher and interaction with selected secondary school students. Again, the consultant agreed to use the same set of arbitrarily established criteria during each assessment process using the "Classroom Observational Scale" (*INSTRUMENT 8*) during October 1974, December 1974, February 1975, and April 1975.

INSTRUMENT 6

OPEN-ENDED EVALUATION OF WORKSHOP ACTIVITIES

Workshop Evaluation:

In the space provided below and perhaps on the back side of this sheet, we would appreciate your comments concerning the six-week workshop. We are foregoing our usual checklist or questionnaire evaluation technique in order to give more weight to the sentiments which you feel especially worthy of recording. We ask you to record your recommendations for improving this type of workshop. We also request that you record what you thought was particularly useful so that these activities would be continued. Please feel free also to note what you did not like. You may sign your sheet or not, as you wish.

Thank you.

* *

Verbatim Comments per Participant

I thought the workshop was very useful because it provided time and materials to develop a specific project for use in the school next fall. I believe everyone came up with something of value. In working with other members from my school, I felt much was gained. On the other hand, isolation from other members was not really desirable. Some comment has already been made about supplies. On the last day one member I know wanted to dry-mount and laminate his whole project and there were no materials, either those that were ordered, or those that could be borrowed from the host school. I would like to have had more structure in the Institute; at least one organized lecture each day; five and one-half hours of time to work independently was much too long a block of time. In some cases the time was not used productively. It would have been helpful to have had the Director on site during the Institute. The role of the graduate assistants was very ambiguous. Their help varied from being very useful to being useless. I think they did not conceive of their role in a clear-cut way. One really did not know whom to ask for a given item. Some flexibility is necessary and good, but I believe they would have also benefited by a designated role.

INSTRUMENT 7

SCIENCE CLASSROOM PROFILE

		1	2	3	4	5	
1.	Teacher performs demonstrations						Students work with laboratory activities
2.	Definitions formulated by students						Definition supplied by teacher or textbook
3.	Written tests only for evaluation						Evaluation including observation and performance tests
4.	Emphasis upon how to solve problems						Emphasis upon how things are put together or operate
5.	Teacher's main task is to present information						Teacher serves as a resource person
6.	Single assignment for entire class						Widely varied assignments
7.	Direct students by providing answers						Direct students by asking questions
8.	Students' data may lead to several different conclusions						Students' data leads to one correct conclusion
9.	Teacher knows answers to all problems						Teacher may explore and learn with students
10.	Student activities aimed at verifying facts or principles						Student activities used as a source of basic data
11.	Teacher allows time for students to discover their own errors - uses questions to point out possible problems						Teacher points out students' errors as they occur
12.	Students capable of much independent activity						Students require much direction and assistance
13.	Students explore ideas suggested by teacher						Students have freedom to explore materials according to their own curiosity

INSTRUMENT 8

CLASSROOM OBSERVATIONAL SCHEDULE

A = Often
B = Sometimes
C = Never
D = Not Observed

	A	B	C	D
1. The teacher employs divergent rather than convergent questions to guide students.				
2. The students are allowed to work at various rates of speed.				
3. Students form the hypotheses for new problems rather than the teacher.				
4. Students state the conclusions when analyzing data rather than the teacher.				
5. The teacher acts as a guide rather than "teller" of science.				
6. The teacher is comfortable even when he/she does not know the answers to students' questions.				
7. The teacher is willing to explore with the students when she does not know the answer.				
8. The teacher takes time to listen, question and observe individual students.				
9. The teacher is alert to groups or individuals who are too frustrated to continue their work.				
10. The teacher will correct students by guiding rather than by telling the answer.				

Three Two One Not Counted

Secondary School Students' Evaluation

Many of the teachers and all of the department chairpersons felt, "as long as everything else was being evaluated," that an evaluation by the secondary students might be interesting and possibly yield important classroom decision-making information. All teachers agreed, even a few hostile ones, to allow their students to rate them on selected teaching/learning dimensions. Early in the school year the consultant and a small group of teachers, with the aid of several unidentified dittoed scales and a few group identified items, constructed *INSTRUMENT 9*. The consultant picked up the administered "Student Questionnaire" (*INSTRUMENT 9*) during his December 1974 and April 1975 visits to each implementing classroom. It was also agreed upon that the participants/teachers would administer the "Student Questionnaire" (*INSTRUMENT 9*) to all of the sections he or she taught, which in most cases were six classes.

Inservice Teachers' Supervisory Behavior

One of the intents of the proposed project was to prepare inservice teachers to function within a much larger institutional effort. The institutional commitment was an emerging preservice "Secondary Science Teacher Preparation Program" (SSTPP) which had been funded internally by the Division of Teacher Education. The inservice teachers received instruction and utilized indirect counseling and training techniques for use with preservice teachers who might be preparing and teaching lessons. The project participants were taught a model of supervision focusing on the "helping relationship" for use with preservice teachers. The inservice teachers were to direct preservice teachers into initial teaching experiences. Lessons to be taught by the preservice teachers were to be selected from materials associated with the nationally supported secondary science programs.

In order to evaluate the achievement of this objective, *INSTRUMENT 10* was constructed by modification of a scale developed by Blumberg and Amidon (1965). "Preservice Teacher's Perceptions of Inservice Teacher's Supervisory Behavior" (*INSTRUMENT 10*) was administered by the classroom teacher during a preservice teacher's field-based experience of which he/she was the supervisor. *INSTRUMENT 10* was collected by the consultant during his visits.

CONCLUDING REMARKS

The evaluation effort described in this paper has been an attempt to "get-at" what was happening by affording a glimpse at all perceived relevant aspects of the inservice teacher preparation program. This "holistic" type of evaluation (Stake, 1972) involved the assessment of most of the intended goals, the interactions that occurred, and the actual project outcomes. The understanding of an emerging inservice secondary science education program is probably proportional to the quality and quantity of the information concerning the program. In one sense, the ultimate evaluation might describe everything that happened, the situation in which it occurred, and the effects of each event. With information of this nature, the decision-makers are in a better position to establish causal linkages between events and outcomes. Program modifications based on these analyses will more often lead to program improvements. Of course, time and financial costs will limit the comprehensiveness of any evaluation effort. As was the case in this endeavor, there were dozens of dimensions needing evaluation that were left untouched. However, if the evaluation is to be a true estimation of worth, it must proceed as far as possible in an attempt to capture the complexity of what is really happening in a program.

INSTRUMENT 9

STUDENT QUESTIONNAIRE

	YES	NO	NOT SURE
1. My teacher likes to have me ask questions.			
2. My teacher has activities that I can do.			
3. I take part in the discussions in class.			
4. My teacher provides extra materials in class.			
5. My teacher tries to make class interesting.			
6. I enjoy science class.			
7. My teacher provides group activities.			
8. My teacher gives me suggestions of activities that I can do at home.			
9. My teacher does the experiments in class.			
10. I get to do experiments in class.			

PRESERVICE TEACHER'S PERCEPTIONS OF INSERVICE TEACHER'S SUPERVISORY BEHAVIOR

Remember that your task in completing this questionnaire is to try to react to the questions from the point of view of how you perceive your contacts with your instructor, not how you feel they should be. Listed below are a number of ways that your instructor might behave in conferences with you. We are interested in the extent of emphasis you see him putting on these areas in his conferences with you. Please place an X in the appropriate place opposite each behavior specified. (It is possible, of course, to place heavy or little emphasis on more than one kind of behavior.)

	very heavy emphasis	fairly heavy emphasis	moderate emphasis	not too much emphasis	very little emphasis	no emphasis
1. Gives his opinions about current teaching practice	___	___	___	___	___	___
2. Suggests that you do things in a specific way or tells you specifically what to do	___	___	___	___	___	___
3. Criticizes your teaching behavior	___	___	___	___	___	___
4. Accepts and clarifies your ideas about your teaching problems	___	___	___	___	___	___
5. Asks you non-critical questions about your teaching behavior (i.e., why you did what you did)	___	___	___	___	___	___
6. Gives you objective information about your teaching behavior (i.e., leaves his feelings out of it)	___	___	___	___	___	___
7. Praises your teaching	___	___	___	___	___	___
8. Asks for your opinions about how to overcome your teaching problems	___	___	___	___	___	___
9. Engages you in discussion of your feelings about your supervisory relationship with him (i.e., productiveness, ease of communication, threat, etc.)	___	___	___	___	___	___

Significance of Effort

The early 1970's have provided evidence as to the increasing need for a more intense involvement of teachers in the program development and evaluation of their own preparation. It appears reasonable to presume that preparation/training areas, such as program development, teaching methods, learning environments and teaching materials associated with inservice education will continue to be priorities during the late 1970's. The instruments described earlier have the potential for modification and tailoring to meet the evaluation needs of others in somewhat similar situations, either functioning with external or internal funding. And then there are those operating without extensive resources when developing an evaluation component for a proposal seeking external funds; this paper might be the basis for such a proposal section. Aside from the formative kinds of evaluation information specifically collected for this particular project, consideration might be given to the increased validity of the instrumentation presented here by way of future refinements and replications. There also exists the potential for the development of a formative evaluation model which could provide for the exportation of processes and products resultant from a mutually developed set of needs and values among public schools and college/universities. And lastly, the more recent approaches to evaluation appear highly appropriate for both the development of emergent inservice projects and the revision of traditional inservice programs to make them more timely and effective.

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